Overview of functions

2

Note:
For further details about the "restricted functionality" for the export variants, see the glossary on the enclosed CD-ROM for Catalog NC 60 or the Internet at: www.siemens.com/automation/mall

2

● Basic version
○ Option
◇ Function is dependent on operating software
– Not possible

	Order No.
Control structure/application	
Structure	
• SIMODRIVE 611	See Converters
• SINUMERIK PCU	See Operator Components
Drives	See Converters
• SIMODRIVE 611 digital	
• SIMODRIVE 611 universal HRS [1]	
• SIMODRIVE 611 universal E HRS (via PROFIBUS)	
• SIMODRIVE POSMO A/SI/CD/CA	
• SIMODRIVE base line	
• FM STEPDRIVE (stepper motors)	
Mode groups (MGs)	
• 1 MG	
• Maximum configuration	
NCU 561.4/561.5/571.4/571.5	
NCU 572.4/572.5	
NCU 573.4/573.5	
• Each additional MG	**6FC5 251-0AD00-0AA0**
Machining channels	
• Maximum configuration	
NCU 561.4/561.5/571.4/571.5	
NCU 572.4/572.5	
NCU 573.4/573.5	
• Each additional machining channel	**6FC5 251-0AA07-0AA0**
Additional axis/spindle + channel	
NCU 561.4/561.5	**6FC5 251-0AD08-0AA0**
NCU 571.4/571.5/572.4/572.5/573.4/573.5	

1) Activation via analog or PROFIBUS interface.
2) For positioning tasks using the PLC.
3) In excess of ±10 V, not PROFIBUS.
4) With system software Plus (requirements: PCU with 1.2 GHz).
With system software Basic and Universal: 2.
5) With NCU system software 2/6/12 axes: max. 2 MGs/2 channels.

SINUMERIK 802				SINUMERIK 810D powerline/840Di/840D powerline						Note on operating software Blank field: Function is not dependent on operating software					
802S base line	802C base line	802D base line	802D	810DE power-line	810D power-line	840DiE	840Di	840DE power-line	840D power-line	HMI Ad-van-ced	HMI Em-bed-ded	Shop Mill	Manual Turn	Shop Turn	HT 6
–	–	–	–	●	●	–	–	●	●						
●	●	●	●	–	–	●	●	–	–						
–	–	–	–	●	●	–	–	●	●						
–	●	–	–	○ 2)	○ 2)	●	●	○ 2)	○ 2)						
–	● 3)	●	●	○ 2)	○ 2)	●	●	○ 2)	○ 2)						
–	–	–	–	○ 2)	○ 2)	●	●	○ 2)	○ 2)						
–	●	–	–	–	–	–	–	–	–						
●	–	–	–	–	–	–	–	–	–						
●	●	●	●	●	●	●	●	●	●						
1	1	1	1	2	2	6 4)	6 4)			10	10	1	1	1	10
								2	2						
								6 5)	6 5)						
								10 5)	10 5)						
–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	
● 1	● 1	● 1	● 1	● 1	● 1	● 1	● 1	● 1	● 1						
1	1	1	1	2	2	6 4)	6 4)			10	10	1	1	1	10
								2	2						
								6 5)	6 5)						
								10 5)	10 5)						
–	–	–	–	○	○	○	○	○	○						
–	–	–	–	–	–	–	–								
								○	–						
								–	–						

● Basic version
○ Option
◇ Function is dependent on operating software
– Not possible

Order No.

Control structure/application (continued)

CNC main memory (buffered) for programs and data in MB (SINUMERIK 810D/840D: max. 0.3 MB is reserved by Technology cycles by Siemens; measuring cycles by Siemens require 0.25 MB in addition)	
NCU 561.4/571.4/572.4	
NCU 561.5/571.5/572.5/573.4/573.5	
Expansion of CNC main memory by 1 MB	**6FC5 251-0AD02-0AA0**
CNC main memory, maximum configuration	
NCU 561.4/571.4/572.4	
NCU 561.5/571.5/572.5/573.4/573.5	
Axes/spindles or positioning axes/auxiliary spindles	
• Maximum configuration of axes	
NCU 561.4/561.5	
NCU 571.4/571.5	
NCU 572.4/572.5/573.4/573.5	
• Maximum configuration of spindles	
NCU 561.4/561.5	
NCU 571.4/571.5	
NCU 572.4/572.5/573.4/573.5	
• Maximum configuration of axes and spindles	
NCU 561.4/561.5	
NCU 571.4/571.5	
NCU 572.4/572.5/573.4/573.5	
• Configuration per channel axes incl. spindles	
NCU 561.4/561.5	
NCU 571.4/571.5	
NCU 572.4/572.5/573.4/573.5	
Each additional interpolation axis/spindle [1]	**6FC5 251-0AA03-0AA0**
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	

1) Option: If number of axes + spindles > 5.
2) With system software Plus (requirements: PCU with 1.2 GHz).
With system software Basic: 6.
With system software Universal: 10.
3) Display of max. 5 axes + 1 spindle.

SINUMERIK 802				SINUMERIK 810D powerline/840Di/840D powerline											
802S base line	802C base line	802D base line	802D	810DE power-line	810D power-line	840DiE	840Di	840DE power-line	840D power-line	Note on operating software Blank field: Function is not dependent on operating software HMI Ad-van-ced	HMI Em-bed-ded	Shop Mill	Manual Turn	Shop Turn	HT 6
● 0.25	● 0.25	● 0.25	● 0.25	● 0.5	● 0.5	● 1	● 1								
								● 0.5	● 0.5						
								● 3	● 3						
–	–	–	–	○	○	–	–	○	○						
0.25	0.25	0.25	0.25	2.5	2.5	● 5	● 5								
								2.5	2.5						
								6	6						
● 4	● 4	● 3	● 5	● 5	● 5	● 5	● 5	● 5	● 5						
3	3	2	4	6	6	18 [2]	18 [2]			31	31	12	2	12	31
								2	2						
								6	6						
								31	31						
1	1	1	1+1	2	2	18 [2]	18 [2]			31	31	1	1+C	3+2C	31
								2	2						
								6	6						
								31	31						
4	4	3	5	6	6	18 [2]	18 [2]			31	31	12 [3]	4	12 [3]	31
								2	2						
								6	6						
								31	31						
4 1	4 1	3 1	5 1 (1+1)	6 2	6 2	12 [2] 12 [2]	12 [2] 12 [2]			12 12	12 12	12 1	4 1	12 3	12 12
								2	2						
								6	6						
								12	12						
–	–	–	–	○	○	○	○								
								–	–						
								○	○						

● Basic version
○ Option
◇ Function is dependent on operating software
– Not possible

Order No.

Control structure/application (continued)

Each additional positioning axis (axis-specific feed) or auxiliary spindle (spindle-specific speed) [1]	**6FC5 251-0AA04-0AA0**
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Activation of internal drive control of 6th axis for positioning tasks (contains additional positioning axis or auxiliary spindle)	**6FC5 451-0AF01-0AA0**
Activation of internal drive control of 6th axis for interpolation tasks (contains additional interpolation axis/spindle)	**6FC5 451-0AF02-0AA0**
Additionally as a package: 2nd machining channel and maximum memory configuration	**6FC5 451-0AF03-0AA0**
Additionally as a package: 4 machining channels and 13 axes	**6FC5 251-0AD01-0AA0**
NCU 561.4/561.5/571.4/571.5	
NCU 572.4/572.5/573.4/573.5	
Connection of FM 354 as PLC positioning axis	See Basic Components
Connection of FM 353 as PLC positioning axis	See Basic Components

Measuring systems that can be connected

Max. number	
NCU 561.4/561.5	
NCU 571.4/571.5	
NCU 572.4/572.5/573.4/573.5	
Incremental rotary measuring system with RS 422 (TTL)	
Linear incremental encoder with current signals	
• Via external EXE	
• Via SIMODRIVE 611 digital closed-loop control module	
Linear incremental encoder with sin/cos 1 V_{PP}	
• On-board	
• Via external EXE	
• Via SIMODRIVE 611 digital closed-loop control module	
• Via SIMODRIVE 611 universal HRS incremental shaft encoder output	
• Via SIMODRIVE 611 universal HRS (linear axis)	
Linear incremental encoder with distance-coded reference marks	
• On-board	
• Via SIMODRIVE 611 digital closed-loop control module	
• Via SIMODRIVE 611 universal HRS (closed-loop control module)	

1) Option: If number of axes + spindles > 5.
2) For spindle only.
3) SINUMERIK 810D measurement channels and via SIMODRIVE 611 digital closed-loop control module.
4) Two measurement systems per axis.
5) Second measurement system for one axis via 2nd axis SIMODRIVE 611 universal HRS or ADI 4.
6) For analog axes via ADI 4.

SINUMERIK 802				SINUMERIK 810D powerline/840Di/840D powerline											
802S base line	802C base line	802D base line	802D	810DE power-line	810D power-line	840DiE	840Di	840DE power-line	840D power-line	Note on operating software Blank field: Function is not dependent on operating software HMI Ad-van-ced	HMI Em-bed-ded	Shop Mill	Manual Turn	Shop Turn	HT 6
–	–	–	–	○	○	○	○								
								–	–						
								○	○						
–	–	–	–	○	○	–	–	–	–						
–	–	–	–	○	○	–	–	–	–						
–	–	–	–	○	○	–	–	–	–						
–	–	–	–	–	–	○ 8)	○ 8)								
								–	–						
								○	○						
–	–	–	–	●	●	–	–	●	●						
–	–	–	–	●	●	–	–	●	●						
1	4	3	5	12 3)	12 3)	36 4) 5)	36 4) 5)								
								4 4)	4 4)						
								12 4)	12 4)						
								62 4)	62 4)						
● 2)	●	● 2)	● 2)	–	–	● 6)	● 6)	–	–						
–	●	● 9)	● 9)	–	–	–	–	–	–						
–	–	–	–	●	●	–	–	●	●						
–	–	–	–	●	●	–	–	–	–						
–	●	● 9)	● 9)	–	–	–	–	–	–						
–	–	–	–	●	●	–	–	●	●						
–	●	–	–	–	–	–	–	–	–						
–	–	●	●	○ 7)	○ 7)	●	●	○ 7)	○ 7)						
–	–	–	–	●	●	–	–	–	–						
–	–	–	–	●	●	–	–	●	●						
–	–	–	–	○ 7)	○ 7)	●	●	○ 7)	○ 7)						

7) For positioning tasks.
8) With system software Plus (requirements: PCU with 1.2 GHz).
9) Via ADI 4.

2

● Basic version
○ Option
◇ Function is dependent on operating software
– Not possible

Order No.

Measurement systems that can be connected (continued)

Rotary measurement systems with distance-coded reference marks	
• On-board	
• Via SIMODRIVE 611 digital closed-loop control module	
• Via SIMODRIVE 611 universal HRS (closed-loop control module)	
Absolute value encoder connection with SSI interface	
Absolute value encoder connection with EnDat linear/rotary	
• On-board	
• Via SIMODRIVE 611 digital closed-loop control module	
• Via SIMODRIVE 611 universal HRS (closed-loop control module)	
Absolute value/incremental encoder installed in 1FT6/1FK	
• On-board	
• Via SIMODRIVE 611 digital closed-loop control module	
• Via SIMODRIVE 611 universal HRS (closed-loop control module)	
Incremental encoder with sin/cos 1 V_{PP}	
• On-board	
• Via SIMODRIVE 611 digital closed-loop control module	
• Via SIMODRIVE 611 universal HRS (closed-loop control module)	
Resolver installed in 1FT6/1FK	
• Via SIMODRIVE 611 universal HRS (closed-loop control module)	
• Via SIMODRIVE base line (only 1FK7 with 2-pole resolver)	

CNC functionality: Program functions

Dynamic preprocessing memory (FIFO)	
Look Ahead	
Program preprocessing	**6FC5 251-0AC02-0AA0**
Axis/spindle replacement	
Geometry axes, switchable online in the CNC program	
Frame concept	
Inclined-surface machining with frames	

1) Second measurement system for one axis via 2nd axis SIMODRIVE 611 universal HRS.
2) For analog axes with ADI 4.
3) For positioning tasks.
4) Number of traversing blocks cannot be parameterized.
5) Not as motor measuring system, only for spindles or rotary axes for direct position sensing.
6) Via SIMODRIVE 611 universal E HRS closed-loop control module.

SINUMERIK 802				SINUMERIK 810D powerline/840Di/840D powerline						Note on operating software Blank field: Function is not dependent on operating software					
802S base line	802C base line	802D base line	802D	810DE power-line	810D power-line	840DiE	840Di	840DE power-line	840D power-line	HMI Ad-van-ced	HMI Em-bed-ded	Shop Mill	Manual Turn	Shop Turn	HT 6
–	–	–	–	●	●	–	–	–	–						
–	–	–	–	●	●	–	–	●	●						
–	–	–	–	○ 5)	○ 5)	–	–	○ 5)	○ 5)						
–	–	–	–	–	–	● 2)	● 2)	●	●						
–	–	–	–	●	●	–	–	–	–						
–	–	–	–	●	●	–	–	●	●						
–	–	● 6)	● 6)	○ 3)	○ 3)	● 1)	● 1)	○ 3)	○ 3)						
–	–	–	–	●	●	–	–	–	–						
–	–	–	–	●	●	–	–	●	●						
–	–	● 6)	● 6)	○ 3)	○ 3)	●	●	○ 3)	○ 3)						
–	–	–	–	●	●	–	–	–	–						
–	–	–	–	●	●	–	–	●	●						
–	●	● 6)	● 6)	○ 3)	○ 3)	●	●	○ 3)	○ 3)						
–	●	–	–	○ 3)	○ 3)	●	●	○ 3)	○ 3)						
–	●	–	–	–	–	–	–	–	–						
●	●	●	●	●	●	●	●	●	●						
● 4)	● 4)	● 4)	● 4)	●	●	●	●	●	●						
–	–	–	–	○	○	○	○	○	○						
–	–	–	–	●	●	●	●	●	●						
–	–	–	–	●	●	●	●	●	●						
–	–	●	●	●	●	●	●	●	●						
–	–	–	–	●	●	●	●	●	●						

● Basic version
○ Option
◇ Function is dependent on operating software
– Not possible

	Order No.
CNC functionality: Axis functions	
Feedrate override of 0 ... 200%	
Feedrate override, axis-specific of 0 ... 200%	
Traversing range ± 9 decades	
Rotary axis, turning endlessly	
Measuring system 1 and 2, selectable	
Speed, max. 300 m/s	
Acceleration with jerk limitation	
Programmable acceleration	
Feedrate interpolation	
Separate path feed for corners and chamfers	
Traversing to fixed stop	**6FC5 255-0AB02-0AA0**
Traversing to fixed stop (without Force Control)	**6FC5 655-0AA01-0AA0**
Follow-up mode	
Pair of synchronized axes (gantry axes) Max. number	**6FC5 255-0AB00-0AA0**
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Trailing axes (TRAIL)	
Master/slave for drives	**6FC5 251-0AC07-0AA0**
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Analog axis [1]	**6FC5 251-0AC06-0AA0**
Setpoint exchange	**6FC5 251-0AE76-0AA0**
Tangential control	**6FC5 251-0AB11-0AA0**
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Position switching signals/cam controller	**6FC5 251-0AB07-0AA0**

1) SINUMERIK 840DE powerline/840D powerline: From the 6th axis upwards, the option "Each additional interpolating axis/spindle" is included. For SINUMERIK 840DiE/840Di with ADI 4.

2) In SW Version 6.4 and higher, functionality is included in the NCU system software.

3) In SW Version 7.1 and higher, functionality is included in the NCU system software.

SINUMERIK 802				SINUMERIK 810D powerline/840Di/840D powerline						Note on operating software Blank field: Function is not dependent on operating software					
802S base line	802C base line	802D base line	802D	810DE power-line	810D power-line	840DiE	840Di	840DE power-line	840D power-line	HMI Ad-van-ced	HMI Em-bed-ded	Shop Mill	Manual Turn	Shop Turn	HT 6
120	120	●	●	●	●	●	●	●	●						
–	–	●	●	●	●	●	●	●	●						
●	●	●	●	●	●	●	●	●	●						
–	–	–	●	●	●	●	●	●	●						
–	–	–	–	●	●	●	●	●	●						
12	●	●	●	●	●	●	●	●	●						
–	–	–	●	●	●	●	●	●	●						
●	●	●	●	●	●	●	●	●	●						
–	–	–	–	●	●	●	●	●	●						
–	–	–	–	●	●	●	●	●	●						
–	–	–	–	○	○	○	○	○	○						
–	–	–	○	–	–	–	–	–	–						
–	●	●	●	●	●	●	●	●	●						
–	–	–	–	○ 1	○ 1	○ 3	○ 3								
								–	–						
								○ 3	○ 3						
–	–	–	–	●	●	●	●	●	●						
–	–	–	–	○	○	–	–								
								–	–						
								○	○						
–	–	–	–	–	–	–	–	○ 2)	○ 2)						
–	–	–	–	–	–	–	–	○ 3)	○ 3)						
–	–	–	–	○	○	○	○								
								–	–						
								○	○						
–	–	–	–	○	○	○	○	○	○						

● Basic version
○ Option
◇ Function is dependent on operating software
– Not possible

Order No.

CNC functionality: Axis functions (continued)

Link axis [1]	**6FC5 251-0AD10-0AA0**
NCU 561.4/561.5/571.4/571.5/572.4/572.5	
NCU 573.4/573.5	
Axis container	**6FC5 251-0AE01-0AA0**
NCU 561.4/561.5/571.4/571.5/572.4/572.5	
NCU 573.4/573.5	
Setpoint linkage for multiple NCUs [1]	**6FC5 251-0AF02-0AA0**
NCU 561.4/561.5/571.4/571.5/572.4/572.5	
NCU 573.4/573.5	
Fast IPO link [1]	**6FC5 251-0AF03-0AA0**
NCU 561.4/561.5/571.4/571.5/572.4/572.5	
NCU 573.4/573.5	
Advanced Position Control APC	**6FC5 251-0AF04-0AA0**

CNC functionality: Spindle functions

Analog spindle speed	
Digital spindle speed	
Spindle speed, max. programmable value range: REAL ± 3.4028 ex 38 (display: ± 999 999 999.9999)	
Spindle override of 0 ... 200%	
5 gear stages	
Automatic gear stage selection	
Oriented spindle stop	
Spindle speed limitation (min. and max.)	
Constant cutting rate	
Spindle control via PLC (positioning, oscillation)	
Changeover to axis mode	
Axis synchronization on-the-fly	
Thread run-in and run-out programmable	
Thread cutting with constant or variable pitch	
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Tapping with/without compensating chuck	
Synchronous spindle/multi-edge turning	**6FC5 255-0AB01-0AA0**
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	

1) Requirement: Link module.
2) Value range: 999 999.999.
3) Only SPOS and basic functions.
4) Via ADI 4.

SINUMERIK 802				SINUMERIK 810D powerline/840Di/840D powerline						Note on operating software Blank field: Function is not dependent on operating software					
802S base line	802C base line	802D base line	802D	810DE power-line	810D power-line	840DiE	840Di	840DE power-line	840D power-line	HMI Ad-van-ced	HMI Em-bed-ded	Shop Mill	Manual Turn	Shop Turn	HT 6
–	–	–	–	–	–	–	–								
								–	–						
								○	○						
–	–	–	–	–	–	○	○								
								–	–						
								○	○						
–	–	–	–	–	–	–	–								
								–	–						
								○	○						
–	–	–	–	–	–	–	–								
								–	–						
								○	○						
–	–	–	–	–	–	–	–	○	○						
●	●	●	●	–	–	● 4)	● 4)	–	–						
–	–	●	●	●	●	●	●	●	●						
● 2)	● 2)	●	●	●	●	●	●	●	●						
120	120	●	●	●	●	●	●	●	●						
●	●	●	●	●	●	●	●	●	●						
●	●	●	●	●	●	●	●	●	●						
●	●	●	●	●	●	●	●	●	●						
●	●	●	●	●	●	●	●	●	●						
●	●	●	●	●	●	●	●	●	●						
●	●	●	●	●	●	●	●	●	●						
–	–	–	–	●	●	●	●	●	●						
● 3)	● 3)	● 3)	● 3)	●	●	●	●	●	●						
–	–	–	–	●	●	●	●	●	●						
●	●	●	●	●	●	●	●	●	●						
●	●	●	●	●	●	●	●								
								–	–						
								●	●						
●	●	●	●	●	●	●	●	●	●						
–	–	–	–	○	○	○	○								
								–	–						
								○	○						

● Basic version
○ Option
◇ Function is dependent on operating software
– Not possible

Order No.

CNC functionality: Interpolations

Universal interpolator NURBS (non-uniform rational B-splines)	
Continuous-path mode with programmable rounding clearance	
Linear interpolation axes	
• Maximum	
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Multi-axis interpolation (> 4 interpolating axes)	**6FC5 251-0AA16-0AA0**
Circle via center point and end point	
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Circle via interpolation point	
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Helical interpolation:	
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Spline interpolation (A, B and C splines/compressor) for 3-axis machining	**6FC5 251-0AF14-0AA0**
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Spline interpolation (A, B and C splines/compressor) for 5-axis machining	**6FC5 251-0AA14-0AA0**
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Polynomial interpolation	**6FC5 251-0AA15-0AA0**
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Master-value coupling and curve table interpolation	**6FC5 251-0AD06-0AA0**
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Involute interpolation	**6FC5 251-0AF01-0AA0**
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	

1) With restricted functionality, see export information.
2) With system software Plus (requirements: PCU with 1.2 GHz).
With system software Basic: 6
With system software Universal: 10.
3) Only tapping: Axis + spindle.

SINUMERIK 802				SINUMERIK 810D powerline/840Di/840D powerline						Note on operating software Blank field: Function is not dependent on operating software					
802S base line	802C base line	802D base line	802D	810DE power-line	810D power-line	840DiE	840Di	840DE power-line	840D power-line	HMI Ad-van-ced	HMI Em-bed-ded	Shop Mill	Manual Turn	Shop Turn	HT 6
–	–	–	–	●	●	●	●	●	●						
–	–	–	–	●	●	●	●	●	●						
●	●	●	●	●	●	●	●	●	●						
3	3	2	4	4	4	4	4	4	4						
3	3	2	4	4	6	4	12 [2]								
								2 [3]	2 [3]						
								4	12						
–	–	–	–	–	○	–	○	–	○						
●	●	●	●	●	●	●	●								
								–	–						
								●	●						
●	●	●	●	●	●	●	●								
								–	–						
								●	●						
2D+1	2D+1	–	2D+2	2D+2	2D+2	2D+2	2D+6								
								–	–						
								2D+2	2D+6						
–	–	–	–	○	○	○	○								
								–	–						
								○	○						
–	–	–	–	○	○	○	○								
								–	–						
								○	○						
–	–	–	–	○	○	○	○								
								–	–						
								○	○						
–	–	–	–	○ [1]	○	○ [1]	○								
								–	–						
								○ [1]	○						
–	–	–	–	○	○	○	○								
								–	–						
								○	○						

● Basic version
○ Option
◇ Function is dependent on operating software
– Not possible

Order No.

CNC functionality: Interpolations (continued)

Electronic gear EG	**6FC5 251-0AE00-0AA0**
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Axial coupling in the machine coordinate system (MCS coupling)	**6FC5 251-0AD11-0AA0**
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Continue machining at the contour (retrace support)	**6FC5 251-0AE72-0AA0**
Advanced Processing 1	**6FC5 251-0AF10-0AA0**
Advanced Processing 2	**6FC5 251-0AF11-0AA0**

CNC functionality: Transformations

Cartesian point-to-point (PTP) traversing	
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
TRANSMIT/peripheral surface transformation	**6FC5 251-0AB01-0AA0**
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
TRANSMIT/peripheral surface transformation	**6FC5 651-0AA02-0AA0**
Inclined axis	**6FC5 251-0AB06-0AA0**
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Chained transformations (inclined axis TRAANG to TRAORI/Universal milling head/TRANSMIT/TRACYL)	
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Machining package milling [6]	**6FC5 251-0AG00-0AA0**
Machining package 5 axes [1]	**6FC5 251-0AA10-0AA0**
Handling transformation package	**6FC5 251-0AD07-0AA0**
Generic transformation	
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	

1) Contains the option "Multi-axis interpolation".
2) Only with system software Universal and Plus.
3) Only with system software Plus.
4) With 3-axis and 4-axis transformation.

SINUMERIK 802				SINUMERIK 810D powerline/840Di/840D powerline											
802S base line	802C base line	802D base line	802D	810DE power-line	810D power-line	840DiE	840Di	840DE power-line	840D power-line	Note on operating software Blank field: Function is not dependent on operating software HMI Ad-van-ced	HMI Em-bed-ded	Shop Mill	Manual Turn	Shop Turn	HT 6
–	–	–	–	–	–	○	○								
								–	–						
								○	○						
–	–	–	–	–	–	–	○								
								–	–						
								–	○ 5)						
–	–	–	–	○	○	○	○	○ 5)	○ 5)						
–	–	–	–	–	–	○ 2)	○ 2)	–	–						
–	–	–	–	–	–	○ 3)	○ 3)	–	–						
–	–	–	–	●	●	●	●								
								–	–						
								●	●						
–	–	–	–	○	○	○	○								
								–	–						
								○	○						
–	–	–	○	–	–	–	–	–	–						
–	–	–	–	○	○	○	○								
								–	–						
								○	○						
–	–	–	–	●	●	●	●								
								–	–						
								●	●						
–	–	–	–	–	–	–	○	–	○						
–	–	–	–	–	–	–	○	–	○						
–	–	–	–	–	○	–	○	–	○ 5)						
–	–	–	–	● 4)	● 4)	● 4)	●								
								–	–						
								● 4)	●						

5) Loadable compile cycle in SW Version 6.4 and higher in the NCU system software.

6) Includes options: Machining package 5 axes, Multi-axis interpolation, Spline interpolation for 5-axis machining, 3D tool radius compensation.

● Basic version
○ Option
◇ Function is dependent on operating software
– Not possible

Order No.

CNC functionality: Measuring

Measuring Stage 1 2 sensors (switching) with/without deletion of distance-to-go	See HMI Software
Measuring Stage 2 (logging of measurement results, measurement functions from synchronized actions, cyclic measurement)	**6FC5 250-0AD00-0AA0** See HMI Software

CNC functionality: Technologies

Punching/nibbling	**6FC5 251-0AC00-0AA0**
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Oscillation functions (block-related, modal and asynchronous)	**6FC5 251-0AB04-0AA0**
More than one feed in block (e. g. for calipers)	
Handwheel override	
Contour handwheel	
Electronic transfer	**6FC5 250-0AD05-0AA0**
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	

CNC functionality: Motion-synchronous action

High-speed CNC inputs/outputs	
• 4 digital inputs/4 digital outputs on-board	
• Expansion via NCU terminal block 32 digital inputs/32 digital outputs, 8 analog inputs/8 analog outputs	See Basic Components
• Expansion via SIMATIC S7 I/O 32 digital inputs/32 digital outputs 4 analog inputs/4 analog outputs	
Synchronized action (max. 16) and high-speed auxiliary function output	
Synchronized action Stage 2 (up to 255 parallel actions per channel, technology cycles)	**6FC5 251-0AD05-0AA0**
Positioning axes and spindles via synchronized actions (command axes)	
Analog value control in interpolation cycle (requirement: analog output)	
Path velocity-dependent analog output (laser power control)	**6FC5 251-0AC04-0AA0**
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	

1) 1 sensor.
2) With restricted functionality, see export information.
3) Requirement: MCI board extension.
4) Requirement: SIMATIC DP ET 200 analog module.

SINUMERIK 802				SINUMERIK 810D powerline/840Di/840D powerline						Note on operating software Blank field: Function is not dependent on operating software					
802S base line	802C base line	802D base line	802D	810DE power-line	810D power-line	840DiE	840Di	840DE power-line	840D power-line	HMI Ad-van-ced	HMI Em-bed-ded	Shop Mill	Manual Turn	Shop Turn	HT 6
–	–	–	● 1)	●	●	● 3)	● 3)	●	●						
–	–	–	–	○ 2)	○	○ 2) 3)	○ 3)	○ 2)	○						
–	–	–	–	–	–	○	○								
								–	–						
								○	○						
–	–	–	–	○	○	○	○	○	○						
–	–	–	–	●	●	●	●	●	●						
–	–	–	–	●	●	●	●	●	●						
–	–	–	–	●	●	●	●	●	●						
–	–	–	–	–	–	○ 2)	○								
								–	–						
								○ 2)	○						
–	–	–	–	–	–	● 3)	● 3)	●	●						
–	–	–	–	○	○	–	–	○	○						
–	–	–	–	–	–	○	○	–	–						
–	–	–	–	● 2)	●	● 2)	●	● 2)	●						
–	–	–	–	○ 2)	○	○ 2)	○	○ 2)	○						
–	–	–	–	●	●	●	●	●	●						
–	–	–	–	●	●	● 4)	● 4)	●	●						
–	–	–	–	○	○	○ 4)	○ 4)								
								–	–						
								○	○						

● Basic version
○ Option
◇ Function is dependent on operating software
– Not possible

	Order No.
CNC functionality: Motion-synchronous action (continued)	
Laser switching signal, high-speed	**6FC5 251-0AE74-0AA0**
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5: 6/12/31 axes	
Clearance control	
• 1D in interpolation cycle via synchronized action	
• 1D/3D in position control cycle (incl. in interpolation cycle)	**6FC5 251-0AC05-0AA0**
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5: 6/12/31 axes	
Evaluation of internal drive variables (prerequisite for Adaptive Control)	**6FC5 251-0AB17-0AA0**
Continuous Dressing (parallel dressing, online modification of the tool offset)	
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Asynchronous subroutine ASUP [1]	
Interrupt routines with high-speed retraction from the contour	**6FC5 251-0AA00-0AA0**
Multiple mode actions (ASUPs and synchronized actions in all operating modes)	**6FC5 251-0AD04-0AA0**
Open Architecture	
HMI programming package (OEM contract required)	See HMI Software
HMI configuring package (OEM contract required)	See HMI Software
User-interface expansion (HMI Advanced/HMI Embedded)	See HMI Software
OA package NCK (OEM contract required)	See Basic Components
OA NCK compile cycles (runtime license)	**6FC5 251-0AA20-0AA0** See Basic Components

1) High-speed CNC inputs/outputs required.
2) With restricted functionality, see export information.
3) 20 unreserved screens.
4) Configuration via PROFIBUS DP.

SINUMERIK 802				SINUMERIK 810D powerline/840Di/840D powerline						Note on operating software Blank field: Function is not dependent on operating software					
802S base line	802C base line	802D base line	802D	810DE power-line	810D power-line	840DiE	840Di	840DE power-line	840D power-line	HMI Ad-van-ced	HMI Em-bed-ded	Shop Mill	Manual Turn	Shop Turn	HT 6
–	–	–	–	–	–	○	○								
								–	–						
								○ 5)	○ 5)						
–	–	–	–	●	●	●	●	●	●						
–	–	–	–	–	–	○ 2)	○								
								–	–						
								○ 2) 5)	○ 5)						
–	–	–	–	○ 2)	○	○ 2) 4)	○ 4)	○ 2)	○						
–	–	–	–	● 2)	●	● 2)	●								
								–	–						
								● 2)	●						
–	–	–	–	●	●	●	●	●	●						
–	–	–	–	○	○	○	○	○	○						
–	–	–	–	○	○	○	○	○	○						
–	–	–	–	○	○	○	○	○	○						
–	–	–	–	○	○	○	○	○	○						
–	–	–	–	◇	◇	◇	◇	◇	◇	○ 3)	○ 3)	○ 3)	○ 3)	○ 3)	○ 3)
–	–	–	–	–	–	–	–	–	○						
–	–	–	–	–	–	–	–	–	○						

5) Loadable compile cycle in SW Version 6.4 and higher in the NCU system software.

2

● Basic version
○ Option
◇ Function is dependent on operating software
– Not possible

Order No.

CNC programming: Language

Programming language (DIN 66025 and high-level language expansion)	
Main program calls from main programs and subroutines	
Subroutine levels/interrupt routines, max.	
Number of subroutine repetitions ≤ 9999	
Number of levels for skippable blocks (/0 to /...)	
Polar coordinates	
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
1/2/3-point contours	
Dimensions metric/inch, changeover manually or via program	
Inverse-time feedrate	
Auxiliary function output	
• Via M word, max. programmable value range: INT 2^{31}-1	
• Via H word, max. programmable value range: REAL ± 3.4028 ex 38 (display: ± 999 999 999.9999) INT -2^{31} ... 2^{31}-1	
High-level language CNC with	
• User variables, configurable	
• Predefined user variables (arithmetic parameters), configurable	
• Read/write system variables	
• Indirect programming	
• Program jumps and branches	
• Program coordination with WAIT, START, INIT	
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
• Arithmetic and trigonometric functions	
• Comparing operations and logic combinations	
• Macro techniques	
• Control structures (IF-ELSE-ENDIF, WHILE, FOR, REPEAT, LOOP)	
• Commands to HMI	
• STRING functions	

1) M function: 1 ... 99.

SINUMERIK 802				SINUMERIK 810D powerline/840Di/840D powerline						Note on operating software Blank field: Function is not dependent on operating software					
802S base line	802C base line	802D base line	802D	810DE power-line	810D power-line	840DiE	840Di	840DE power-line	840D power-line	HMI Ad-van-ced	HMI Em-bed-ded	Shop Mill	Manual Turn	Shop Turn	HT 6
●	●	●	●	●	●	●	●	●	●						
●	●	●	●	●	●	●	●	●	●						
4/0	4/0	8/0	8/0	11/4	11/4	11/4	11/4	11/4	11/4						
●	●	●	●	●	●	●	●	●	●						
1	1	1	1	8	8	8	8	8	8						
–	–	●	●	●	●	●	●								
								–	–						
								●	●						
●	●	●	●	●	●	●	●	●	●						
●	●	●	●	●	●	●	●	●	●						
–	–	–	–	●	●	●	●	●	●						
● 1)	● 1)	●	●	●	●	●	●	●	●						
–	–	●	●	●	●	●	●	●	●						
–	–	–	–	●	●	●	●	●	●						
●	●	●	●	●	●	●	●	●	●						
–	–	–	–	●	●	●	●	●	●						
–	–	●	●	●	●	●	●	●	●						
●	●	●	●	●	●	●	●	●	●						
–	–	–	–	●	●	●	●								
								–	–						
								●	●						
●	●	●	●	●	●	●	●	●	●						
●	●	●	●	●	●	●	●	●	●						
–	–	–	–	●	●	●	●	●	●						
–	–	–	–	●	●	●	●	●	●						
–	–	–	–	◇	◇	◇	◇	◇	◇	●	●	–	–	–	–
–	–	–	–	●	●	●	●	●	●						

2

● Basic version
○ Option
◇ Function is dependent on operating software
– Not possible

Order No.

CNC programming: Language (continued)

Online ISO dialect interpreter	**6FC5 253-0AE00-0AA0**
Program management	
• Management of programs and workpieces in NCK	
• Management of programs and workpieces on hard disk (HD)	
• Management of programs and workpieces on diskette drive	
• Management of programs and workpieces on network drive	
• Max. number of workpieces on NC/NC + HD	
• Templates for workpieces, programs and INI files	
• Job lists	

CNC programming: Cycles

Process-oriented cycles for drilling/milling and turning	See HMI Software
Pocket milling with free contour definition and islands	See HMI Software
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Pocket milling with free contour definition, islands and residual material removal	See HMI Software
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Enhanced stock removal functions with blank part description	See HMI Software
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Enhanced stock removal functions with blank part description and residual material removal	See HMI Software
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Measuring cycles for drilling/milling and turning	See HMI Software
Access protection for cycles	
Cycle storage separate from CNC main memory	**6FC5 251-0AF00-0AA0**

1) Management of workpieces is not possible.
2) Requirement: DNC (option).
3) With different functionality.
4) Partially.

SINUMERIK 802				SINUMERIK 810D powerline/840Di/840D powerline						Note on operating software Blank field: Function is not dependent on operating software					
802S base line	802C base line	802D base line	802D	810DE power-line	810D power-line	840DiE	840Di	840DE power-line	840D power-line	HMI Ad-van-ced	HMI Em-bed-ded	Shop Mill	Manual Turn	Shop Turn	HT 6
–	–	–	●	○	○	○	○	○	○						
● 1)	● 1)	● 1)	● 1)	●	●	●	●	●	●	●	●	●	●	●	●
–	–	–	–	◇	◇	●	●	◇	◇	●	–	●	–	●	–
–	–	–	–	◇	◇	◇	◇	◇	◇	●	○	○	–	○	–
–	–	–	–	◇	◇	◇	◇	◇	◇	○ 2)	○	○	–	○	–
100/–	100/–	100/–	100/–	250/–	250/–	310	310	250/–	250/–	–/310	–	–/310	–/310	–/310	–
–	–	–	–	◇	◇	◇	◇	◇	◇	●	–	–	–	–	–
–	–	–	–	◇	◇	◇	◇	◇	◇	●	–	–	–	–	–
●	●	●	●	◇	◇	◇	◇	◇	◇	●	○	●	● 3)	●	–
–	–	–	–	◇	◇	◇	◇			○	–	●	–	●	–
								–	–						
								◇	◇						
–	–	–	–	◇	◇	◇	◇			○	–	○	–	○	–
								–	–						
								◇	◇						
–	–	–	–	◇	◇	◇	◇			○	–	–	○	●	–
								–	–						
								◇	◇						
–	–	–	–	○	○	○	○			○	–	–	○	○	–
								–	–						
								○	○						
–	–	–	–	○	○	○	○	○	○	○	○	● 4)	–	● 4)	–
●	●	●	●	●	●	●	●	●	●		–				
–	–	–	–	○	○	○	○	○	○						

2

● Basic version
○ Option
◇ Function is dependent on operating software
– Not possible

Order No.

CNC programming: Program support

Program editor	
• Text editor with editing functions: Marking, copying, deleting, ...	
• Machining step programming	See HMI Software
• Write protection for lines	
• Suppression of lines in the display	
• Dual editor	
• Multi-channel sequence programming	**6FC5 253-0AF03-0AA0**
AutoTurn/AutoTurn Plus	See HMI Software
Program support for geometry entries	
• Geometry processor with programming graphics/ Free contour input (contour calculator)	See HMI Software
• Screens for 1/2/3-point contours	
Program support for cycles	
• Screens and stationary auxiliary displays	
• Dynamic programming graphics during programming	
• Programming support expandable (e. g. customer cycles)	

Parameter

Max. number of basic frames	
Max. number of selectable offsets	
Work offsets, programmable (frames)	
Scratching, determining work offset	
Work offsets, external (PLC)	
Global and local user data	
Global program user data	
Display system variables (also via online configurable display) and log them	

1) Configurable by Siemens.
2) For presentation of the machining step.
3) With "Expand user interface", see HMI/MMC start-up instructions.
4) With "Customer cycles" function.

SINUMERIK 802				SINUMERIK 810D powerline/840Di/840D powerline						Note on operating software Blank field: Function is not dependent on operating software					
802S base line	802C base line	802D base line	802D	810DE power-line	810D power-line	840DiE	840Di	840DE power-line	840D power-line	HMI Ad-van-ced	HMI Em-bed-ded	Shop Mill	Manual Turn	Shop Turn	HT 6
●	●	●	●	◇	◇	●	●	◇	◇	●	●	●	●	●	●
–	–	–	–	◇	◇	◇	◇	◇	◇	–	–	○	●	○	–
–	–	–	–	◇	◇	◇	◇	◇	◇	●	–	●	–	●	–
–	–	–	–	◇	◇	◇	◇	◇	◇	●	–	● 2)	–	●	–
–	–	–	–	◇	◇	◇	◇	◇	◇	●	●	–	–	–	–
–	–	–	–	◇	◇	–	–	◇	◇	○	–	–	–	–	–
–	–	–	–	◇	◇	–	–	◇	◇	○	–	–	–	–	–
–	–	–	–	◇	◇	◇	◇	◇	◇	●	●	●	○	●	–
●	●	●	●	◇	◇	◇	◇	◇	◇	●	●	●	–	●	●
●	●	●	●	◇	◇	◇	◇	◇	◇	●	●	●	●	●	–
–	–	–	–	◇	◇	◇	◇	◇	◇	–	–	●	●	●	–
1)	1)	1)	1)	◇	◇	◇	◇	◇	◇	● 3)	● 3)	● 3)	● 4)	● 3)	●
1	1	1	1	16	16	◇	◇	16	16	16	16	1	1	1	–
4	4	6	6	100	100	◇	◇	100	100	100	100	100	4	100	100
1	1	●	●	●	●	●	●	●	●						
●	●	●	●	◇	◇	◇	◇	◇	◇	●	●	●	●	●	–
–	–	–	–	●	●	●	●	●	●	●	●	●	●	●	–
–	–	–	–	●	●	◇	◇	●	●	●	–	●	–	●	●
–	–	–	–	●	●	◇	◇	●	●	●	●	●	–	●	●
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● Basic version
○ Option
◇ Function is dependent on operating software
– Not possible

Order No.

Simulation

Up to n channels can be simulated sequentially	
NCU 561.4/561.5	
NCU 571.4/571.5	
NCU 572.4/572.5/573.4/573.5	
Several channels and programs can machine the same blank part in succession	
Simulation of program X, while program Y is executed	
Drilling/milling [1]	
• Multi-sided 2D view, dynamic	
• 3D view, static	
• Simultaneous recording (real-time simulation of current machining)	See HMI Software
Turning [1]	
• Traverse path simulation without model (broken-line graphics)	
• Contour of blank part can be specified	
• Simulation in working plane G18	
• Simulation in working planes G17/G19	
• Full cut/partial cut with circumferential edges, front face and peripheral surfaces, milling and drilling operations	
• Counterspindle	
• 3D simulation of the finished part (static/dynamic)	See HMI Software
• Simultaneous recording (real-time simulation of current machining)	
Turning [1]	**6FC5 673-0AB01-0AF0**
• Traverse path simulation without model (broken-line graphics)	
• Simulation in working plane G18	
• Simultaneous recording (real-time simulation of current machining)	

Operating modes

JOG	
• Handwheel selection	
• Inch/metric changeover	
• Manual measurement of work offset	
• Manual measurement of tool compensation	
• Automatic tool/workpiece measurement	See HMI Software
• Reference point approach, automatic/via CNC program	

1) Toolholder vertical to the workpiece.
2) Single-sided broken-line graphics at programming level.
3) Dynamic for PCU 50/PCU 70.
4) Requirement: Measurement cycles.

SINUMERIK 802				SINUMERIK 810D powerline/840Di/840D powerline						Note on operating software Blank field: Function is not dependent on operating software					
802S base line	802C base line	802D base line	802D	810DE power-line	810D power-line	840DiE	840Di	840DE power-line	840D power-line	HMI Ad-van-ced	HMI Em-bed-ded	Shop Mill	Manual Turn	Shop Turn	HT 6
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								6	6						
								10	10						
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5) Only turning.

2

● Basic version
○ Option
◇ Function is dependent on operating software
– Not possible

Order No.

Operating modes (continued)

MDA	
• Input in text editor	
• Save MDA program	
• Input screen forms for technology and positioning, cycle support	
Teach In	
• Teach positions in MDA buffer	
• Teach (record/playback)	
• Teach In with HT 6	
Teach In	**6FC5 571-0AA01-0BF0**
Automatic	
• Execution from network drive or PC card for PCU 20	See HMI Software
• Execution from V.24 (RS 232 C) interface	
• Execution from hard disk	
• Program control	
• Program editing:	
• Overstoring	
• DRF offset	
• Block search with/without calculation	
Repos (repositioning on the contour)	
• With operator command/semi-automatically	
• Program-controlled	
Preset	
Set actual value	

Tools

Tool types	
• Turning	
• Drilling/milling	
• Grinding	
• Groove sawing	

1) Requirement: DNC (option).
2) Possible with restrictions.
3) Requirement: Management of network and diskette drive on PCU 20 (option).

SINUMERIK 802				SINUMERIK 810D powerline/840Di/840D powerline						Note on operating software Blank field: Function is not dependent on operating software					
802S base line	802C base line	802D base line	802D	810DE power-line	810D power-line	840DiE	840Di	840DE power-line	840D power-line	HMI Ad-van-ced	HMI Em-bed-ded	Shop Mill	Manual Turn	Shop Turn	HT 6
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2

● Basic version
○ Option
◇ Function is dependent on operating software
– Not possible

Order No.

Tools (continued)

Tool radius compensations in plane	
• With approach and retract strategies	
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
• With transition circle/ellipse on outer edges	
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Configurable intermediate blocks with tool radius compensation active	
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
3D tool radius compensation	**6FC5 251-0AB13-0AA0**
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Tool change via T number	
Tool holder with orientation capability	
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Look-ahead detection of contour violations	
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Grinding-specific tool compensation with grinding wheel surface speed	
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Tool orientation interpolation [1)]	
Online tool length compensation	
Operation without tool management	
• Tool compensation selection via D number without T assignment (flat D number)	
• Editing of tool data	
• Tool compensation selection via T and D numbers	
• Data backup via V.24 (RS 232 C) interface	
• Number of tools/cutting edges in tool list	

1) Requirement: Machining package for 5 axes (option).
2) Available soon.

SINUMERIK 802				SINUMERIK 810D powerline/840Di/840D powerline						Note on operating software Blank field: Function is not dependent on operating software					
802S base line	802C base line	802D base line	802D	810DE power-line	810D power-line	840DiE	840Di	840DE power-line	840D power-line	HMI Ad-van-ced	HMI Em-bed-ded	Shop Mill	Manual Turn	Shop Turn	HT 6
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15/30	15/30	18/36	3)	600/ 1500	600/ 1500	600/ 1500 ◇	600/ 1500 ◇	600/ 1500	600/ 1500			–	–	–	

3) For turning 32/64. For milling 48/96.

2

● Basic version
○ Option
◇ Function is dependent on operating software
– Not possible

Order No.

Tools (continued)

Operation with tool management	**6FC5 251-0AB12-0AA0**
• System displays in standard software	
• Easy start-up via system displays	
• Tool list	
• Configurable tool lists	
• Number of tools/cutting edges in tool list	
• Unambiguous D number structure	
• Tool compensation selection via T and D numbers	
• Editing of tool data	
• Editing of OA data	
• Magazine list	
• Configurable magazine list	
• More than one magazine is possible	
• Magazine data	
• Vacant position search and positioning	
• Easy vacant position search using softkeys	
• Loading and unloading of tools	
• More than one loading and unloading point per magazine	
• Tool cabinet and tool catalog	
• Loading and unloading via code carrier system	
• Adapter data	
• Local offsets	
• Connection to TDI	
• Data backup on hard disk	
• Data backup via V.24 (RS 232 C) interface	
Monitoring of tool life and workpiece count	**6FC5 651-0AA01-0AA0**

1) Valid for PCU 50/PCU 70. For PCU 20: 250/500.
2) Available soon.
3) Available with PCU 50.

2

SINUMERIK 802				SINUMERIK 810D powerline/840Di/840D powerline											
										Note on operating software Blank field: Function is not dependent on operating software					
802S base line	802C base line	802D base line	802D	810DE power-line	810D power-line	840DiE	840Di	840DE power-line	840D power-line	HMI Ad-van-ced	HMI Em-bed-ded	Shop Mill	Man-ual Turn	Shop Turn	HT 6
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● Basic version
○ Option
◇ Function is dependent on operating software
– Not possible

	Order No.
Communication	
Serial interface V.24 (RS 232 C)	
Secure data transfer (Z modem)	
Parallel interface (Centronics)	
Diskette drive operation	See HMI Software
Multipoint interface (MPI)	
Ethernet connections	See HMI Software
Interfacing to I/O via PROFIBUS DP [1] (software option)	**6FC5 252-0AD00-0AA0**
Data interchange between machining channels	
High-speed data interchange between CNC and PLC	
Data backup on hard disk	
Data backup on PC card	
PC card as additional program memory (PCU 20)	
ePS Network Services	
eP Access	See HMI Software
eP Dynamic	See HMI Software
eP Performance	See HMI Software
Motion Control Information System MCIS	
DNC Machine/IFC: CNC program transfer via the network	See HMI Software
TDI: Tool management function for individual machines and networked machines	See HMI Software
TDI Ident Connection: Connection to tool identification systems	See HMI Software
MDA Machine/IFC: Machine and production data acquisition	See HMI Software
RPC SINUMERIK: Data interchange between CNC and host computer	See HMI Software
TPM Machine: Support for maintenance and repair	See HMI Software
RCS@Event	See HMI Software

1) For literature on the subject of PROFIBUS DP, see Services.
2) For PCU 50/PCU 70.
3) Requirement: DNC (option).

SINUMERIK 802				SINUMERIK 810D powerline/840Di/840D powerline						Note on operating software Blank field: Function is not dependent on operating software					
802S base line	802C base line	802D base line	802D	810DE power-line	810D power-line	840DiE	840Di	840DE power-line	840D power-line	HMI Ad-van-ced	HMI Em-bed-ded	Shop Mill	Manual Turn	Shop Turn	HT 6
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4) HMI Embedded SW Version 6.2. and higher.
Remote diagnostics on PC card is not possible.
Requirement: Management of network/diskette drive on PCU 20 (option).

5) Available soon.
6) For PCU 50/PCU 70 with HMI-Advanced, SW Version 6.0 and higher.
7) On request.

2

● Basic version
○ Option
◇ Function is dependent on operating software
– Not possible

	Order No.
Data management	
A&D DataManagement: Data management system (requirement: SIMATIC STEP 7)	See HMI Software
Tool identification system	
Connection of tool identification system MOBY E	See HMI Software
Operation	
Operator panel fronts OP 015/OP 015A/TP 015A, 15" color	See Operator Components
Operator panel fronts OP 012, 12.1" color	See Operator Components
Operator panel fronts TP 012, 12.1" color [3]	See Operator Components
Operator panel fronts OP 010/OP 010C/OP 010S, 10.4" color	See Operator Components
PCU 20 [2]	See Operator Components
PCU 50 [2]	See Operator Components
PCU 70 [2]	See Operator Components
Physical separation of operator panel front (OP) and PCU as well as connection of up to 3 operator panels of the same type	
1 operator panel for up to 8 NCUs/ 2 operator panels for up to 4 NCUs	
Control unit management for each PCU (up to 9 PCUs for up to 9 NCUs) Functionality: Active, passive and displacement mechanisms	**6FC5 253-0AE03-0AA0**
Integrated operator panel: SINUMERIK 802S/802C base line, 8" monochrome	See Basic Components
Operator panel SINUMERIK 802D base line/802D, 10.4" monochrome/color	See Basic Components
Slimline operator panel OP 030 with system software	See Operator Components
Connections for OP7/OP17 operator panel	
Connection of SIMATIC HMI to PLC	
Connection of SIMATIC Panels OP 170/TP 170/OP 270/TP 270 to SINUMERIK with ProTool	
SINUMERIK HT 6 handheld terminal	See Operator Components
Mini handheld unit	See Operator Components
B-MPI handheld unit	See Operator Components
Machine control panel	See Operator Components
Pushbutton panel	See Operator Components
Electronic handwheels can be connected	See Operator Components

1) Three CCUs on one operator panel. Two operator panels on one CCU.
2) HMI software for PC/PG can be ordered separately.
3) For customized operator interface.
4) Third handwheel can be operated as a contour handwheel.
5) Requirement: MCI board extension.

SINUMERIK 802				SINUMERIK 810D powerline/840Di/840D powerline												
802S base line	802C base line	802D base line	802D	810DE power-line	810D power-line	840DiE	840Di	840DE power-line	840D power-line	Note on operating software Blank field: Function is not dependent on operating software HMI Ad-van-ced	HMI Em-bed-ded	Shop Mill	Manual Turn	Shop Turn	HT 6
–	–	–	–	◇	◇	◇	◇	◇	◇	○	–				–
–	–	–	–	◇	◇	–	–	◇	◇	○					
–	–	–	–	○	○	○	○	○	○	○	○	○	–	○	–
–	–	–	–	○	○	○	○	○	○	○	○	○	–	○	–
–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–
–	–	–	–	○	○	○	○	○	○	○	○	○	○	○	–
–	–	–	–	○	○	–	–	○	○	○	●	○	○	○	–
–	–	–	–	○	○	●	●	○	○	○	○	○	○	○	–
–	–	–	–	○	○	–	–	○	○	○	○	○	○	○	–
–	–	–	–	○	○	○	○	○	○						
–	–	–	–	● 1)	● 1)	–	–	●	●	●	●	–	–	–	–
–	–	–	–	–	–	–	–	◇	◇	○	○	–	–	–	○
●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	●/○	●/○	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	○	○	–	–	○	○	–	–	–	–	–	–
–	–	–	–	●	●	●	●	●	●						
–	–	–	–	●	●	●	●	●	●						
–	–	–	–	●	●	●	●	●	●						
–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	●
○	○	○	○	○	○	○	○	○	○						
–	–	–	–	○	○	○	○	○	○						
●	●	○	○	○	○	○	○	○	○						
–	–	–	–	○	○	○	○	○	○						
2	2	3	3	2/3 4)	2/3 4)	2 5)	2 5)	2/3 4)	2/3 4)						

2

● Basic version
○ Option
◇ Function is dependent on operating software
– Not possible

Order No.

Operation (continued)

CNC keyboard, horizontal/vertical	See Basic Components
Full CNC keyboard	See Operator Components
Standard PC keyboard MF-II	See Operator Components
Diskette drive (3.5"/1.44 MB)	See Operator Components
Diskette drive (3.5"/1.44 MB) with USB connection	See Operator Components
Plain text display of user variables	
Multi-channel display	
2D representation of 3D protection areas/work areas	
Actual-value system for workpiece (grinding)	
Menu selection via the PLC	
CNC program messages	
Online help for programming, alarms and machine data (expandable)	
Screen blanking	
Access protection, 8 levels	
2 languages switchable online	
Languages: English, German	
Languages: English, German, French, Italian, Spanish	
Language: Simplified Chinese	
Language: Traditional Chinese	
Languages: Polish, Russian, Czech, Turkish, Hungarian	
Languages: Danish, Dutch, Finnish, Japanese, Portuguese/Brazilian, Swedish	
Language: Korean	
Other languages	
Operating software can be used for:	
• SINUMERIK 810D powerline/840D powerline	See HMI Software
• SINUMERIK 840Di	See HMI Software
User interface with TRANSLINE 2000 HMI Pro software	See HMI Software
User interface with TRANSLINE 2000 HMI Lite CE software	See HMI Software

1) Included in scope of supply.
2) Included on the system software CD-ROM.
3) SW Version 6.4 and higher.
4) SW Version 6.5 and higher.
5) Included on CD-ROM of HMI language expansion. Please enquire about available software versions.
6) On request.

SINUMERIK 802				SINUMERIK 810D powerline/840Di/840D powerline												
802S base line	802C base line	802D base line	802D	810DE power-line	810D power-line	840DiE	840Di	840DE power-line	840D power-line	Note on operating software Blank field: Function is not dependent on operating software HMI Ad-van-ced	HMI Em-bed-ded	Shop Mill	Manual Turn	Shop Turn	HT 6
–	–	○	● 9)	–	–	–	–	–	–						
–	–	–	–	○	○	○	○	○	○						
–	–	–	–	○	○	○	○	○	○						
–	–	–	–	◇	◇	○	○	◇	◇	○	○	○	○	○	–
–	–	–	–	◇	◇	–	–	◇	◇	○	–	–	–	–	–
–	–	–	–	●	●	◇	◇	●	●	●	●	●	–	●	●
–	–	–	–	◇	◇	–	–	◇	◇	●	–	–	–	–	–
–	–	–	–	●	●	◇	◇	●	●	●	●	–	–	–	–
–	–	–	–	●	●	●	●	●	●	●	●	–	–	–	–
–	–	–	–	–	–	–	–	◇	◇	●	●	●	–	●	–
–	–	●	●	●	●	◇	◇	●	●	●	●	–	–	–	●
–	–	–	–	●	●	◇	◇	●	●	●	–	–	–	–	–
–	–	–	–	●	●	●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●	●	●	●	–	●	●
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
● 1)	● 1)	● 1)	● 1)	◇	◇	◇	◇	◇	◇	●	● 2)	●	●	●	● 2)
● 1)	● 1)	● 1)	● 1)	◇	◇	◇	◇	◇	◇	● 3)	● 4)	● 8)	–	● 3)	–
–	–	● 1)	● 1)	◇	◇	◇	◇	◇	◇	○ 5)	○ 5)	○ 5)	–	○ 5)	–
● 1)	● 1)	● 1)	–	◇	◇	◇	◇	◇	◇	○ 5)	○ 5)	○ 5)	○ 5)	○ 5)	○ 6)
–	–	–	–	◇	◇	◇	◇	◇	◇	○ 5)	○ 5)	○ 5)	○ 5)	○ 5)	○ 6)
–	–	● 1)	● 1)	◇	◇	◇	◇	◇	◇	○ 5)	○ 5)	○ 5)	–	○ 5)	○ 5)
6)	6)	6)	6)	6)	6)	6)	6)	6)	6)	6)	6)	6)	6)	6)	6)
–	–	–	–	○	○	–	–	○	○	○	○	○	○	○	○
–	–	–	–	–	–	○	○	–	–	○	–	○ 7)	–	–	○
–	–	–	–	–	–	◇	◇	◇	◇	○	–	–	–	–	–
–	–	–	–	–	–	–	–	○	○	–	–	–	–	–	–

7) Requirement: Uninterruptible power supply and SINUMERIK 840Di SW Version 2.3.
8) SW Version 6.3 and higher.
9) For scope of supply, see Ordering Data.

2

● Basic version
○ Option
◇ Function is dependent on operating software
– Not possible

	Order No.
Axis monitoring	
Working area limitation	
Limit switch monitor Software and hardware limit switch	
2D/3D protection zones	
Contour monitoring	
Contour monitoring with tunnel function	**6FC5 251-0AB16-0AA0**
Position monitoring	
Standstill monitoring	
Clamping monitoring	
Path length evaluation	**6FC5 251-0AF05-0AA0**
Compensations	
Backlash compensation	
Leadscrew error compensation	
Measuring system error compensation	
Electronic weight counterbalances	**6FC5 255-0AC00-0AA0**
Sag compensation, multi-dimensional	**6FC5 251-0AB15-0AA0**
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Quadrant error compensation per operation	
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Quadrant error compensation, automatic (neural network)	**6FC5 251-0AB14-0AA0**
NCU 561.4/561.5	
NCU 571.4/571.5/572.4/572.5/573.4/573.5	
Graphical monitoring of the quadrant error compensation using the circularity test	See HMI Software
Temperature compensation	**6FC5 251-0AA13-0AA0**
Automatic drift compensation for analog speed setpoints	
Precontrol	
• Speed dependent	
• Acceleration dependent	**6FC5 250-0AA07-0AA0**

1) With restricted functionality, see export information.

2) Requirement: Start-up tool for SIMODRIVE 611 digital (already included in HMI-Advanced system software, also for PC/PG).

SINUMERIK 802				SINUMERIK 810D powerline/840Di/840D powerline						Note on operating software Blank field: Function is not dependent on operating software					
802S base line	802C base line	802D base line	802D	810DE power-line	810D power-line	840DiE	840Di	840DE power-line	840D power-line	HMI Ad-van-ced	HMI Em-bed-ded	Shop Mill	Manual Turn	Shop Turn	HT 6
–	–	●	●	●	●	●	●	●	●						
●	●	●	●	●	●	●	●	●	●						
–	–	–	–	●	●	●	●	●	●						
●	●	●	●	●	●	●	●	●	●						
–	–	–	–	○	○	○	○	○	○						
–	●	●	●	●	●	●	●	●	●						
–	●	●	●	●	●	●	●	●	●						
–	●	●	●	●	●	●	●	●	●						
–	–	–	–	○	○	–	–	○	○						
●	●	●	●	●	●	●	●	●	●						
●	●	●	●	●	●	●	●	●	●						
●	●	●	●	●	●	●	●	●	●						
–	–	–	–	○	○	–	–	○	○						
–	–	–	–	○ 1)	○	○ 1)	○								
								–	–						
								○ 1)	○						
–	–	–	–	●	●	◇	◇			●	–	–	–	–	–
								–	–						
								●	●						
–	–	–	–	○	○	–	–								
								–	–						
								○	○						
–	–	–	–	◇	◇	–	–	◇	◇	●	○ 2)				–
–	–	–	–	○	○	○	○	○	○						
–	●	–	–	–	–	–	–	–	–						
–	–	●	●	●	●	●	●	●	●						
–	–	–	–	○	○	–	–	○	○						

● Basic version
○ Option
◇ Function is dependent on operating software
– Not possible

Order No.

PLC area

SIMATIC S7-200 (integrated)	
SIMATIC S7-300 CPU 315-2 DP (integrated)	
SIMATIC S7-300 CPU 314C-2 DP (integrated)	
NCU 561.4/571.4/572.4/573.4	
SIMATIC S7-300 CPU 317-2 DP (integrated)	
NCU 561.5/571.5/572.5/573.5	
Machining time, typically in ms/KI for bit operations [3]	
NCU 561.4/571.4/572.4/573.4	
NCU 561.5/571.5/572.5/573.5	
Machining time, typically in ms/KI for word operations [3]	
NCU 561.4/571.4/572.4/573.4	
NCU 561.5/571.5/572.5/573.5	
PLC user memory in KB, incl. basic PLC program	
NCU 561.4/571.4/572.4/573.4	
NCU 561.5/571.5/572.5/573.5	
PLC user memory, maximum configuration in KB	
NCU 561.4/571.4/572.4/573.4	
NCU 561.5/571.5/572.5/573.5	
Expansion of the PLC user memory by 64 KB	**6FC5 252-0AA03-0AA0**
Ladder steps memory configuration	
PLC programming with HiGraph (add-on package for STEP 7)	
PLC programming tool	See HMI Software
PLC programming tool, PLC program examples, standard machine data and alarm text editor on Toolbox	
Toolbox with basic PLC program, standard machine data and CNC variable selector	See HMI Software
Digital inputs, input image max. in bytes	
NCU 561.4/571.4/572.4/573.4	
NCU 561.5/571.5/572.5/573.5	
Digital outputs, output image max. in bytes	
NCU 561.4/571.4/572.4/573.4	
NCU 561.5/571.5/572.5/573.5	

1) Without CNC variable selector.
2) Included in the basic package.
3) 1 KI = 1024 instructions; corresponds to approx. 3 KB.
4) With PLC module D I/O.

SINUMERIK 802				SINUMERIK 810D powerline/840Di/840D powerline											
802S base line	802C base line	802D base line	802D	810DE power-line	810D power-line	840DiE	840Di	840DE power-line	840D power-line	Note on operating software Blank field: Function is not dependent on operating software HMI Ad-van-ced	HMI Em-bed-ded	Shop Mill	Manual Turn	Shop Turn	HT 6
●	●	●	●	–	–	–	–	–	–						
–	–	–	–	●	●	–	–	–	–						
–	–	–	–	–	–	–	–								
								●	●						
–	–	–	–	–	–	●	●								
								●	●						
1.8	1.8	0.4	0.4	0.3	0.3	0.03	0.03								
								0.1	0.1						
								0.03	0.03						
5.9	5.9	1.4	1.4	1	1	0.1	0.1								
								0.25	0.25						
								0.1	0.1						
–	–	–	–	● 96	● 96	● 128	● 128								
								● 96	● 96						
								● 128	● 128						
–	–	–	–	288	288	768	768								
								480	480						
								768	768						
–	–	–	–	○	○	○	○	○	○						
4000	4000	6000	6000	–	–	–	–	–	–						
–	–	–	–	○	○	○	○	○	○						
● 2)	● 2)	● 2)	● 2)	–	–	–	–	–	–						
● 2)	● 2)	● 2)	● 2)	–	–	–	–	–	–						
● 1)	● 1)	● 1)	● 1)	○	○	●	●	○	○						
48/ 64 4)	48/ 64 4)	144	144	128	128	128	128								
								128	128						
								256	256						
16/ 32 4)	16/ 32 4)	96	96	128	128	128	128								
								128	128						
								256	256						

● Basic version
○ Option
◇ Function is dependent on operating software
– Not possible

Order No.

PLC area (continued)

I/O inputs, max. number in bytes	
NCU 561.4/571.4/572.4/573.4	
NCU 561.5/571.5/572.5/573.5	
I/O outputs, max. number in bytes	
NCU 561.4/571.4/572.4/573.4	
NCU 561.5/571.5/572.5/573.5	
Bit memories, max. number in bytes	
NCU 561.4/571.4/572.4/573.4	
NCU 561.5/571.5/572.5/573.5	
Timers, max. number	
NCU 561.4/571.4/572.4/573.4	
NCU 561.5/571.5/572.5/573.5	
Counters, max. number	
NCU 561.4/571.4/572.4/573.4	
NCU 561.5/571.5/572.5/573.5	
FB, FC (max. number per type)	
NCU 561.4/571.4/572.4/573.4	
NCU 561.5/571.5/572.5/573.5	
DB, max. number	
NCU 561.4/571.4/572.4/573.4	
NCU 561.5/571.5/572.5/573.5	
Cyclic function block	
Time-controlled function blocks	
Equipment for PLC programming and program test with PG/PC	
Max. number of I/O modules (central configuration)	See Basic Components
Distributed DP slaves on the PROFIBUS DP, max. number:	
NCU 561.4/571.4/572.4/573.4	
NCU 561.5/571.5/572.5/573.5	
PP 72/48 I/O module	See Basic Components
Distributed I/O via PROFIBUS DP	
• Via CP 342-5 DP, data transfer rate up to 1.5 Mbit/s	
• Via integrated interface, data transfer rates up to 12 Mbit/s	See Communication
User machine data for configuring the PLC user program	

1) Number = sum of inputs and outputs.
2) Subroutines.
3) Included in the basic package.
4) Max. number 64, depending on the complexity of the slaves.
5) FBs, FCs and DBs in total max. 2048.

SINUMERIK 802				SINUMERIK 810D powerline/840Di/840D powerline						Note on operating software Blank field: Function is not dependent on operating software					
802S base line	802C base line	802D base line	802D	810DE power-line	810D power-line	840DiE	840Di	840DE power-line	840D power-line	HMI Ad-van-ced	HMI Em-bed-ded	Shop Mill	Manual Turn	Shop Turn	HT 6
48	48	144	144	768 [1]	768 [1]	2048 [1]	2048 [1]								
								2048 [1]	2048 [1]						
								4096	4096						
16	16	96	96	768 [1]	768 [1]	2048 [1]	2048 [1]								
								2048 [1]	2048 [1]						
								4096	4096						
1024	1024	3072	3072	4096	4096	4096	4096								
								4096	4096						
								4096	4096						
16	16	40	40	128	128	512	512								
								256	256						
								512	512						
32	32	32	32	64	64	512	512								
								256	256						
								512	512						
64 [2]	64 [2]	64 [2]	64 [2]	256	256	2048 [5]	2048 [5]								
								256	256						
								2048 [5]	2048 [5]						
–	–	–	–	399	399	2047 [5]	2047 [5]								
								399	399						
								2047 [5]	2047 [5]						
●	●	●	●	●	●	●	●	●	●						
–	–	–	–	●	●	●	●	●	●						
○	○	○	○	○	○	○	○	○	○						
–	–	○ 2	○ 2	○ 24	○ 24	–	–	○ 24	○ 24						
–	–	–	–	○ [4]	○ [4]	○ [4]	○ [4]								
								○ 32	○ 32						
								○ 125	○ 125						
–	–	● [3]	● [3]	–	–	○	○	–	–						
–	–	–	–	●	●	–	–	●	●						
–	–	●	●	○	○	●	●	○	○						
●	●	●	●	●	●	●	●	●	●						

2

● Basic version
○ Option
◇ Function is dependent on operating software
– Not possible

	Order No.
Monitoring functions	
Axis limitation from the PLC	
Spindle speed limitation	
Generator operation	**6FC5 255-0AE00-0AA0**
Extended stop and retract (ESR), incl. generator operation	**6FC5 250-0AE01-0AA0**
Tool and process monitoring [1]	See HMI Software
PROFIBUS tool and process monitoring	**6FC5 251-0AE71-0AA0**
Safety functions	
SINUMERIK Safety Integrated safety functions for personnel and machine protection [2]	See Basic Components
Options up to and equal SW 6:	
• Basic functions for up to 4 axes/spindles	**6FC5 250-0AC10-0AA0**
• Supplementary function from the fifth axis/spindle for each axis/spindle	**6FC5 250-0AC11-0AA0**
• Axis/spindle package for additional 13 axes/spindles	**6FC5 250-0AC12-0AA0**
Options from SW 7 and higher:	
• SI-Basic (for up to 1 axis/spindle; up to 4 inputs/outputs can be used for safe programmable logic)	**6FC5 250-0AG00-0AA0**
• SI-Comfort (for up to 1 axis/spindle; up to 64 inputs/outputs can be used for safe programmable logic)	**6FC5 250-0AG10-0AA0**
• SI-Axis/spindle (from 2nd axis/spindle per axis/spindle)	**6FC5 250-0AG11-0AA0**
• SI-Axis/spindle Package (additional 15 axes/spindles)	**6FC5 250-0AG12-0AA0**
SinuCom NC SI	See HMI Software
Start-up	
Start-up software for converter system is integrated	
• SIMODRIVE 611 digital	
• SIMODRIVE 611 universal HRS	
Start-up software on external PC/PG	See HMI Software
• SIMODRIVE 611 digital	
• SIMODRIVE 611 universal HRS	
User-interface on PC/PG for start-up or servicing during operation without operator panel	See HMI Software
Start-up trace (drive optimization without an additional oscilloscope)	
SinuCom NC Trace	See HMI Software
SINUMERIK 840Di Startup (SimoCom U and SinuCom NC)	
Start-up software for CNC SinuCom NC	See HMI Software
Series start-up via a serial interface	
Series start-up by programming the PC card offline or online	

1) Product of the Solution Provider (currently for ARTIS)
2) Prerequisites: See Basic Components.
3) Included in the basic package.
4) Loadable compile cycle in SW Version 6.4 and higher in the NCU system software.

SINUMERIK 802				SINUMERIK 810D powerline/840Di/840D powerline											
802S base line	802C base line	802D base line	802D	810DE power-line	810D power-line	840DiE	840Di	840DE power-line	840D power-line	Note on operating software Blank field: Function is not dependent on operating software HMI Ad-van-ced	HMI Em-bed-ded	Shop Mill	Manual Turn	Shop Turn	HT 6
–	–	–	–	●	●	●	●	●	●						
●	●	●	●	●	●	●	●	●	●						
–	–	–	–	–	–	–	–	○	○						
–	–	–	–	–	–	–	–	○	○						
–	–	–	–	–	–	–	–	○	○						
–	–	–	–	–	–	–	–	○ 4)	○ 4)						
–	–	–	–	–	–	–	–	○	○						
–	–	–	–	–	–	–	–	○	○						
–	–	–	–	–	–	–	–	○	○						
–	–	–	–	–	–	–	–	○	○						
–	–	–	–	–	–	–	–	○	○						
–	–	–	–	–	–	–	–	○	○						
–	–	–	–	–	–	–	–	○	○						
–	–	–	–	◇	◇	–	–	◇	◇	●	–				–
–	–	–	–	–	–	●	●	–	–	–	–				–
–	–	–	–	○	○	–	–	○	○						
● 3)	● 3)	● 3)	● 3)	○	○	○	○	○	○						
–	–	–	–	○	○	–	–	○	○	○	–				–
●	●	●	●	◇	◇	◇	◇	◇	◇	●	○				–
–	–	–	–	–	–	–	–	○	○						
–	–	–	–	–	–	●	●	–	–						
–	–	–	–	○	○	●	●	○	○						
●	●	●	●	●	●	◇	◇	●	●	●	●				–
–	–	●	●	●	●	–	–	●	●	●	●				–

2

● Basic version
○ Option
◇ Function is dependent on operating software
– Not possible

	Order No.
Diagnostic functions	
PLC status	
LAD display	
Process fault diagnosis for S7-HiGraph and S7-Graph for PCU 50/PCU 70 with TRANSLINE 2000 HMI Pro	See HMI Software
RCS remote diagnostics/host and viewer	See HMI Software
PLC remote diagnostics	**6FC5 653-0AA01-0AA0**
Alarms and messages	
Trip recorder can be activated for diagnostic purposes	
Tools	
SinuCom FFS	See HMI Software
SinuCom ARC	See HMI Software
SINUCOPY-FFS for SIMATIC S7 PG 740	See HMI Software
Programming language SIMATIC STEP 7	See HMI Software
• LAD ladder diagram	
• FBD function block diagram	
• STL statement list	
SIMATIC STEP 7 for SINUMERIK hardware (for service functions)	
SinuCom PCIN	See HMI Software
Data backup (Backup/Restore) with Ghost on hard disk/network	See HMI Software
CAD reader for PC	See HMI Software
Offline SINUMERIK 800/840D CNC program converter	On request

SINUMERIK 802				SINUMERIK 810D powerline/840Di/840D powerline											
802S base line	802C base line	802D base line	802D	810DE power-line	810D power-line	840DiE	840Di	840DE power-line	840D power-line	Note on operating software Blank field: Function is not dependent on operating software HMI Ad-van-ced	HMI Em-bed-ded	Shop Mill	Manual Turn	Shop Turn	HT 6
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Overview of the options for SINUMERIK 810D powerline/840Di/840D powerline

Option	Page	Order No.
2nd additional machining channel and maximum memory expansion as a package	2/6	**6FC5 451-0AF03-0AA0**
3D tool radius compensation	2/32	**6FC5 251-0AB13-0AA0**
Additional axis/spindle + channel (for NCU 561.4)	2/2	**6FC5 251-0AD08-0AA0**
Advanced Position Control	2/12	**6FC5 251-0AF04-0AA0**
Advanced Processing 1	2/16	**6FC5 251-0AF10-0AA0**
Advanced Processing 2	2/16	**6FC5 251-0AF11-0AA0**
Analog axis	2/10	**6FC5 251-0AC06-0AA0**
Axis container	2/12	**6FC5 251-0AE01-0AA0**
Axial coupling in the machine	2/16	**6FC5 251-0AD11-0AA0**
Axis/spindle interpolation, each additional	2/4	**6FC5 251-0AA03-0AA0**
Clearance control, 1D/3D in position control cycle	2/20	**6FC5 251-0AC05-0AA0**
CNC user memory expanded by 1 MB	2/4	**6FC5 251-0AD02-0AA0**
Continue machining at the contour (retrace support)	2/16	**6FC5 251-0AE72-0AA0**
Continuous-path control dependent analog value output	2/18	**6FC5 251-0AC04-0AA0**
Contour monitoring with tunnel function	2/42	**6FC5 251-0AB16-0AA0**
Control unit management	2/38	**6FC5 253-0AE03-0AA0**
Cycle storage separate from CNC main memory	2/24	**6FC5 251-0AF00-0AA0**
Electronic gear unit	2/16	**6FC5 251-0AE00-0AA0**
Electronic transfer	2/18	**6FC5 250-0AD05-0AA0**
Electronic weight counterbalance	2/42	**6FC5 255-0AC00-0AA0**
Enabling of internal drive control 6th axis for interpolation tasks	2/6	**6FC5 451-0AF02-0AA0**
Enabling of internal drive control 6th axis for positioning tasks	2/6	**6FC5 451-0AF01-0AA0**
Evaluation of internal drive variables	2/20	**6FC5 251-0AB17-0AA0**
Extended stop and retract ESR	2/48	**6FC5 250-0AE01-0AA0**
Fast interpolation link	2/12	**6FC5 251-0AF03-0AA0**
Generator operation	2/48	**6FC5 255-0AE00-0AA0**
Handling transformation package	2/16	**6FC5 251-0AD07-0AA0**
Inclined axis	2/16	**6FC5 251-0AB06-0AA0**
Interrupt routines with high-speed retraction from the contour	2/20	**6FC5 251-0AA00-0AA0**
Involute interpolation	2/14	**6FC5 251-0AF01-0AA0**
I/O interfacing via PROFIBUS DP	2/36	**6FC5 252-0AD00-0AA0**
Laser switching signal, high-speed	2/20	**6FC5 251-0AE74-0AA0**
Link axis	2/12	**6FC5 251-0AD10-0AA0**
Machining channel, each additional	2/2	**6FC5 251-0AA07-0AA0**
Machining channels (4) and axes (13) as a package	2/6	**6FC5 251-0AD01-0AA0**
Machining package milling	2/16	**6FC5 251-0AG00-0AA0**
Machining package 5 axes	2/16	**6FC5 251-0AA10-0AA0**

Option	Page	Order No.
Master/slave for drives	2/10	**6FC5 251-0AC07-0AA0**
Master-value coupling and curve table interpolation	2/14	**6FC5 251-0AD06-0AA0**
Measurement level 2	2/18	**6FC5 250-0AD00-0AA0**
Mode group (MG), each additional	2/2	**6FC5 251-0AD00-0AA0**
Multi-axis interpolation	2/14	**6FC5 251-0AA16-0AA0**
Multi-channel sequence programming	2/26	**6FC5 253-0AF03-0AA0**
Non mode-specific actions	2/20	**6FC5 251-0AD04-0AA0**
OA NCK compile cycles	2/20	**6FC5 251-0AA20-0AA0**
Online ISO dialect interpreter	2/24	**6FC5 253-0AE00-0AA0**
Operation with tool management	2/34	**6FC5 251-0AB12-0AA0**
Oscillation functions	2/18	**6FC5 251-0AB04-0AA0**
Pair of synchronized axes (gantry axes)	2/10	**6FC5 255-0AB00-0AA0**
Path length evaluation	2/42	**6FC5 251-0AF05-0AA0**
PLC user memory expanded by 64 KB	2/44	**6FC5 252-0AA03-0AA0**
Polynomial interpolation	2/14	**6FC5 251-0AA15-0AA0**
Positioning axis/auxiliary spindle, each additional	2/6	**6FC5 251-0AA04-0AA0**
Position switching signals/ cam controller	2/10	**6FC5 251-0AB07-0AA0**
Precontrol, acceleration-dependent	2/42	**6FC5 250-0AA07-0AA0**
PROFIBUS tool and process monitoring	2/48	**6FC5 251-0AE71-0AA0**
Program preprocessing	2/8	**6FC5 251-0AC02-0AA0**
Punching/nibbling	2/18	**6FC5 251-0AC00-0AA0**
Quadrant error compensation, automatic	2/42	**6FC5 251-0AB14-0AA0**
Safety Integrated • Axis/spindle package for additional 13 axes/spindles	2/48	**6FC5 250-0AC12-0AA0**
• Basic function	2/48	**6FC5 250-0AC10-0AA0**
• Supplementary function from the 5th axis/spindle	2/48	**6FC5 250-0AC11-0AA0**
Sag compensation, multi-dimensional	2/42	**6FC5 251-0AB15-0AA0**
Setpoint exchange	2/10	**6FC5 251-0AE76-0AA0**
Setpoint linkage spanning NCUs	2/12	**6FC5 251-0AF02-0AA0**
Spline interpolation for 3-axis machining	2/14	**6FC5 251-0AF14-0AA0**
Spline interpolation for 5-axis machining	2/14	**6FC5 251-0AA14-0AA0**
Synchronous actions level 2	2/18	**6FC5 251-0AD05-0AA0**
Synchronous spindle/multi-edge turning	2/12	**6FC5 255-0AB01-0AA0**
Tangential control	2/10	**6FC5 251-0AB11-0AA0**
Temperature compensation	2/42	**6FC5 251-0AA13-0AA0**
TRANSMIT/ peripheral surface transformation	2/16	**6FC5 251-0AB01-0AA0**
Traversing to fixed stop	2/10	**6FC5 255-0AB02-0AA0**